



Iwata Asks

Iwata Asks is a series of interviews conducted by former Nintendo Global President **Satoru Iwata** with key creators behind the making of Nintendo games and hardware.

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Iwata Asks: Wii MotionPlus

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The Gyro Sensor: A New Sense Of Control

Iwata

Wii Sports Resort has not been developed solely as a game, but rather as part of a set in conjunction with Wii MotionPlus. For this reason, I'm planning to do two interviews: one with the team responsible for developing the hardware, and another with the team behind the software. I'm going to start with the hardware team. Would you be kind enough to briefly introduce yourselves?

Takamoto

My name is Junji Takamoto and I work in the Integrated Research and Development Division of the Product Development Department, Development Group No. 3. On the Wii MotionPlus project, I was the project leader on the hardware development side.

Iwata

This is the second time you've taken part in an Iwata Asks interview since the original Wii hardware interviews, isn't it?

Takamoto

Yes, that's right. It's nice to be asked back.

Wakitani

My name is Noboru Wakitani and I work in the same department as Takamoto-san. I was responsible for mechanism design on this project.

Ito

My name is Ito and I work for the Development Group No. 3 in the Integrated Research and Development Division. On this project, I was responsible for the electrical circuitry side.

Ota

My name is Keizo Ota and I'm in a different department from everyone else. I work in the Entertainment Analysis and Development Division, Design Technology Group. I was in charge of developing the SDK for this project.

Iwata

I should explain that the term SDK which Ota-san just mentioned is an abbreviation of "Software Development Kit". Could you briefly explain what exactly it is?

Ota

Put very simply, an SDK is a component used to develop games. I worked in a position where I acted as a liaison between the hardware team and the software dev teams. So my job was to produce the kit needed for game development and to then make this available to the software dev teams.

Iwata

But that's not all you did, is it?

Ota

You're right. The accessory we're discussing today has its own unique and extremely interesting features. But it has its fair share of idiosyncrasies too, so I was required to come up with a lot of ideas to try to deal with these.

Iwata

We're going to have the opportunity to hear all about that very shortly. But firstly, Takamoto-san, could you tell me how the idea for Wii MotionPlus came about and when development got under way?

Takamoto

Well, development got properly under way at the very start of 2008. It was the head of my department, Genyo Takeda, who got the ball rolling when he said: "How about connecting the Wii Remote to a gyro sensor¹?"



Iwata

When he made that suggestion completely out of the blue, weren't you rather at a loss as to how to respond? After all, you'd just struggled to finally get the Wii Remote Jacket distributed worldwide and here you were being ordered to add a gyro sensor!

1. A gyro sensor is a measurement device. Its uses include calculating angle and rotation speed and controlling position. The term "gyro" refers to a "ring" or "rotation".

Takamoto

Well, yes. And what's more, we had to come up with a completely new jacket for the Wii Remote.

Iwata

You did, didn't you? And what name did you come up with for this new Wii Remote Jacket?

Takamoto

We called it the Wii MotionPlus Jacket.



Iwata

Well, that's pretty self-explanatory, at least! (laughs)

Everyone

(laughs)

Takamoto

In order to use the Wii MotionPlus accessory you have to exchange the existing jacket for the new Wii MotionPlus Jacket, which is something I can well imagine will seem rather bothersome to some

of our customers.

Iwata

But it does ensure safer use, after all...

Takamoto

Oh yes, I would certainly urge everyone to make use of it. In particular when playing games like Wii Sports, where there may be large numbers of people playing together.

Iwata

Since this accessory can detect different movements than the original Wii Remote, in addition to very fast movements, there needs to be even more attention paid to ensuring safe usage. This is why we would urge all users to be sure to attach the Wii MotionPlus Jacket when using Wii MotionPlus.

Takamoto

Absolutely. And this is where the decision to combine the Wii MotionPlus Jacket and the Wii MotionPlus accessory came from.

Iwata

So in other words, the Wii MotionPlus accessory and the Wii MotionPlus Jacket are not going to be released separately...

Takamoto

No, the intention was to integrate the two from the very start. This is why when we use the term Wii MotionPlus, we are referring to the accessory with the Wii MotionPlus Jacket attached.



Iwata

So tell me why you decided to go to all the effort of developing Wii MotionPlus in the first place?

Takamoto

It was because the original Wii Remote could only detect movements along straight lines.

Iwata

This is to say that the accelerometer² in the Wii Sports Remote only responded to movements that were along straight lines - such as waving, thrusting and pulling.

2. An accelerometer is an electrical circuit element that can detect changes in speed. The accelerometer in the Wii Remote can detect the rate of acceleration in three dimensions.

Takamoto

That's right. To put it in technical terms, it detected acceleration along straight lines on the X, Y and Z axes. So for instance, when you play golf on Wii Sports, it can detect a swing along a straight line but...

Iwata

But it's not able to detect the angle of the club's face.

Takamoto

Precisely. This is why it couldn't distinguish between hooked or sliced shots. But when you combine the Wii Remote controller's accelerometer with a gyro sensor, it can detect movement along 6 different axes. This means that it won't only detect movements along straight lines, but also movements like rotation and twist. This makes it possible to reproduce the movements of the player very faithfully, which is why we thought a gyro sensor would offer such huge advantages.

Iwata

I suppose the obvious question is: if it offers such huge advantages, why didn't you use it in the Wii Remote from the very start?

**Takamoto**

We actually looked into the idea of including a gyro sensor at the very start of the Wii Remote controllers's development. But the idea was rejected due to issues of both space and cost which attaching a gyro sensor would entail.

Iwata

I see. But gyro sensors are measuring devices that have actually been around for a considerable amount of time, aren't they?

Takamoto

That's right. They were originally called gyroscopes and were used to measure angle and rotation speed in rockets and the navigation systems of ships. But they were very bulky instruments indeed.

Iwata

They're fitted in the noses of airplanes as well, aren't they?

Takamoto

Right. That's the sort of size we're talking about. And let's not forget that they were also extremely expensive. However, with advances in MEMS technology, they have become smaller and smaller while at the same time becoming cheaper...

Iwata

You used the term MEMS just now. Could you explain what that means?

Takamoto

It stands for "Micro-Electromechanical Systems" and refers to micro fabrication techniques that use applied semi-conductor technology to produce extremely small mechanical structures.

Iwata

So thanks to MEMS technology, it has become possible to put a gyro sensor inside a small remote control. As I recall, WarioWare: Twisted!³ also made use of a gyro sensor.

3. WarioWare: Twisted! was the third in the Wario series, released for the Game Boy Advance in October 2004 in Japan.

Takamoto

Well, that was a piezoelectric gyroscope and was a little different in nature from the one we're using now. The impetus for the rapid increase in the use of gyro sensors actually came from their use in video cameras in order to correct camera shake. But there was no way the gyro sensors in cameras could simply be transferred across to be used in a Wii Remote.

**Iwata**

This is something Ota-san mentioned at the start of the interview, but the gyro sensor has its own idiosyncrasies...

Takamoto

Yes, it has its share. It's always been known as quite a tricky piece of kit to work with, but when Takeda-san first mentioned it, I must confess I had no idea that it would prove to be quite this awkward.

Iwata

So the gyro sensor really was an awkward customer to work with...

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Combining Two Sensors

Iwata

So we've heard that the gyro sensor has its own idiosyncrasies but could you tell us precisely what made it so difficult to work with?

Takamoto

Well as we've said, the device can measure twisting and rotation. But having said that, once it goes outside the area where you can actually observe it, there are times you can't be sure that you're receiving reliable data.

Iwata

So that means that if you wave the Wii Remote in a large movement, it could go beyond the limits of the area the sensor can detect and the movement wouldn't end up being reflected in the gameplay.

Takamoto

That's it.

Iwata

Let's ask Ito-san, who was in charge of the electrical circuitry, to explain how you managed to overcome that problem.

Ito

Certainly. Well, we increased the sensitivity of the gyro sensor for Wii to five times the level of a normal one. After all, the gyro sensors used in video cameras can only detect a rotation of about 300 degrees per second, which makes them pretty slow...



Iwata

300 degrees per second doesn't sound slow to me! (laughs)

Ito

But there are people who make incredibly quick movements when they're playing games.

Iwata

So you mean that if the sensor could only detect a rotation of 300 degrees per second, there would be cases where the limit of the sensors would be exceeded and any movement beyond that would be cut off.

Ito

That's right. Which is why we designed the sensor so it could detect 1600 degrees of movement per second.

Iwata

Which is about four and a half complete rotations. For a person to rotate their hand that much would demand quite an effort!

Ito

Right. So by doing that, we made sure that fast movements would be detected. But then we had to discuss the need to detect slow movements.

Iwata

It sounds like there's a contradiction here. After all, if you ensure it can detect quick movements, common sense would tell you that its sensitivity when it comes to detecting slow movements would decrease.

Ito

That's exactly what common sense would tell you! (laughs) But we really wanted to do what we could to make it detect slow movements as well. I had repeated discussions with Ota-san about this.

Ota

We had a fair few discussions about it, didn't we?

**Iwata**

So, Ota-san, how did you solve this issue?

Ota

We designed the sensor so it would have two modes: one for fast movements and the other for slow movements.

Iwata

And what precisely are those two modes?

Ota

Well, as the data from the sensor is sent wirelessly, the resolution of the data is already determined. Let's imagine there are ten bands at which data can be sent. In reality, there are more than this, but I'm using this example to make it easier to understand. So if you have ten bands, this means that you can only send data signals ranging from zero to nine.

Iwata

So let's say that data resolution is fixed at ten bands, you can't simply increase it to twenty, can you?

Ota

That's right - you can't do that. Let's use the speed of a car as an example. With a car that can travel at speeds of up to ten kilometres per hour, data about its current speed would be sent in units of one kilometre per hour. That is to say, each band corresponds to one kilometre per hour. However, if we increase the maximum speed we can measure to one hundred kilometres per hour,

each unit would then become ten kilometres per hour. This would mean we would become unable to detect low speeds such as two or three kilometres per hour.

Iwata

So if you adjust the settings to let you measure high speeds of up to one hundred kilometers per hour, the data will be measured in increments of ten kilometers per hour.

Ota

Correct. This is why we equipped the sensor with two modes: the low-speed mode where the data is sent in ten bands, within a range of up to ten kilometers per hour; and the high-speed mode where the data is sent in ten bands, within a range of up to one hundred kilometers per hour.

Iwata

So by having two modes, you've made high-sensitivity to small movements possible while at the same time allowing detection of more dynamic movements.

Ota

That's right.

Iwata

So that's how you made the sensor so it was able to respond to slow movements. But it wasn't just that which made the gyro sensor hard to handle, was it?



Ota

No, it wasn't. The sensitivity of the gyro sensor's detection ability could be adversely affected by changes in the surrounding temperature.

Takamoto

The "M" in MEMS does stand for "mechanical."

Iwata

So precisely because it is mechanical, it meant that could occur.

Ota

Normally, if something is not in motion, the data being sent back should read zero. But in the case of the gyro sensor, even when it's perfectly still, data that reads one or two will start to be sent back after a while.

Iwata

So although no one is touching it, it's behaving as if it were in motion.

Ota

The technical term for this phenomenon is "temperature drift."

Iwata

So what's happening is that as the temperature changes, the point that should be zero drifts out of place.

Ota

It's not just temperature that can do it: humidity or sudden impacts can have the same effect. So we discussed ways of achieving our aim of somehow getting a sensor made where this problem didn't occur...

Iwata

But isn't that...

Ota

...Impossible! But there is a way of getting round the problem. All you have to do is include a completely separate sensor that adjusts the point of zero, let's say.

Takamoto

But we weren't allowed to ramp up the cost unnecessarily.

Ota

This is why our only option lay in trying to find a software-based solution to the problem. We tried a range of solutions — it was a process of trial and error.



Iwata

This meant that you had no choice but to figure out some method of detecting that the Wii Remote was not currently in motion.

Ota

And the first idea we came up with was an accelerometer. We thought we might be able to use it to detect whether or not it was moving but...

Iwata

But it didn't work, did it?

Ota

No, it didn't. The gyro sensor is much more sensitive than the accelerometer, meaning that there were cases where even though the accelerometer was indicating zero, the gyro sensor was moving.

Iwata

That's no use, is it?

Ota

So ultimately, we made it so that the gyro sensor is actually able to detect that it is not currently moving.

Iwata

So even with fluctuations in temperature and humidity, the gyro sensor is able to function correctly.

Ota

That's right. We included software which made that possible.

Iwata

So Ota-san, while you were trying to tame that hard-to-handle gyro sensor, you were also developing the SDK — that is, the kit for software development. What new directions in game development do you think were opened up by the combination of the accelerometer and the gyro sensor? I'd like to hear your considered opinion as someone who has been involved in the development of a wide variety of game titles.



Ota

I think the single biggest development is that Wii MotionPlus will allow game developers to get a sense of the player's feelings.

Iwata

The player's feelings?

Ota

By being able to detect rotation, the movement of the Wii Remote in the player's hand and the movement of the object on screen have been made to match in real time. That's something that everyone has always dreamed of realizing.

Iwata

That's undoubtedly true.

Ota

But it was by no means easy to achieve that. The measures we've just spoken about, such as broadening the range of the speed detection or increasing the sensitivity of low-speed detection, was not enough by itself.

Iwata

There was also the problem of temperature drift.

Ota

Also, because the data is being transferred wirelessly, there was the possibility of some data not being received. All of which meant that while you were moving the Wii Remote, it became slightly out of synch with the movement of the corresponding object on screen.

Iwata

How did you resolve that problem?

Ota

Using the gyro sensor alone, we couldn't find a satisfactory solution to that problem, but the accelerometer proved very useful in correcting it.

Iwata

So this was something that neither the accelerometer nor the gyro sensor could achieve alone. But by combining both of those sensors, you were able to achieve what you had always wanted — to be able to take account of the way the player was feeling.

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East To Hold With Both Hands

Iwata

So while you were engaged in a bitter struggle with the gyro sensor, tell me how you decided on the shape that the Wii MotionPlus accessory would take.

Wakitani

At the start of the development process, it looked like this.

**Iwata**

It's very different from the design of the finished product.

Wakitani

The first thing we thought of was naturally how comfortable it would be to hold. That was why we chose to make it as compact as possible. But in the end, to prevent possibility of the Wii Remote slipping when they are waving it energetically, we slightly expanded the bottom to give it a kind of skirt shape. On top of that, we have combined the Wii MotionPlus within the Wii MotionPlus Jacket to enhance safety.

**Iwata**

The idea of combining them to ensure safe usage was something that came about after E3, wasn't it?

Wakitani

That's right. But the prototype we put together at that point had a skirt shape with a very gentle curve, meaning that it could become detached very easily.

Takamoto

And from the point of view of maintenance and repairs, we were unable to use any adhesive to secure it.

Wakitani

That's why we made the skirt wider so it was a kind of flange shape such as you would get when fitting a car tire to a wheel. That's how the final shape ended up like this.



Iwata

You really did combine it very snugly with the Wii MotionPlus Jacket, didn't you? (laughs)

Takamoto

By making the skirt wider, you are able to grip on to it tighter, even when you swing the remote strongly. This was a very important consideration.

Wakitani

It's a little like the grip end of a baseball bat.

Iwata

That makes sense. And out of interest, what do you make of the fact that the length of the Wii Remote has increased?

Takamoto

Well, it has made it very comfortable to grip with both hands.

Wakitani

I think that games where you hold the Wii Remote with two hands, such as golf and baseball, have become a great deal easier to play.



Ito

Though with the original Wii Remote, there seems to have been players who swung the bat using only one hand! (laughs)

Takamoto

That's why we thought we could have afforded to make it even longer! (laughs)

All

(laughter)

Iwata

So while the electronic engineering team was doing battle with the gyro sensor, the mechanism design team also had some awkward problems to contend with.

Takamoto

Yes, you could say that! (laughs) Since we're on the subject of connecting the accessory, the bottom of the Wii Remote has an external extension connector for connecting the Nunchuk and other accessories. On either side, all you have are holes.



Iwata

Yes, there are two holes to lock accessories to the Wii Remote.

Takamoto

So we thought about using these two holes and tried to secure the Wii MotionPlus accessory using hooks. But those holes were not originally designed with the purpose of connecting Wii MotionPlus in mind. They were actually designed for a separate purpose, which was attaching accessories in a less secure way.

Iwata

So the designers hadn't envisaged something like Wii MotionPlus which would be attached firmly to the Wii Remote.

Takamoto

Moreover, they hadn't envisaged that the area where the devices were connected would be gripped tightly and shaken repeatedly.

Wakitani

That's why we had cases where there would be temporary disconnection of Wii MotionPlus during use.

Iwata

So the accessory would disconnect from the Wii Remote just for a brief instant?

Wakitani

That's right. So at that point we looked to investigate further by trying to reproduce this temporary disconnection by twisting and turning the Wii MotionPlus accessory. But it wasn't something we

could do by only twisting it slightly.

Takamoto

Without shaking the Wii Remote tens of thousands of times, this temporary disconnection wouldn't reoccur.

Iwata

But you weren't really going to shake it thousands of times to test this, were you? (laughs)

Takamoto

Well, at the start I gave it a go, but after a while my hand got so weary that I had a hard time holding it.



Wakitani

And that's when the gloves went on.

Iwata

You really went that far? (laughs)

Wakitani

But doing it that way would have been far too time-consuming. So it was at that point that we decided to borrow storefront display models for Pokémotion⁴. (laughter)

4. Released by the Pokémon Company in Japan in August 2003, Pokémotion was a "communication tool" shaped like a glow stick. By utilising flashing LEDs, it left images on the eye allowing users to see various Pokémon and words when it was waved rapidly.

Takamoto

That's the store display where the Pokémotion is swung like a metronome.

Iwata

Ah yes, I remember that.

Wakitani

We scraped together all the models we could, from our Okayama office and various departments within the company, and then used them to carry out tests.

Iwata

It's lucky there were still so many left! (laughs)

Wakitani

The conclusion we came to was that the plug for Wii MotionPlus was attached completely rigidly to the connector on the Wii Remote.

Iwata

So it was attached very firmly with no room for give.

Wakitani

Right. Which is why after waving it repeatedly, it inevitably placed a strain on the connector.

Takamoto

If you were to connect it to any normal peripheral it wouldn't be a problem, but in the case of the Wii Remote, because it's a product where you actually grip the connector and wave it repeatedly, it was impossible to avoid a heavy strain being put on it.

Iwata

Which is why this temporary disconnection occurred.

Wakitani

We experimented with a variety of possible solutions, such as putting oil around the connector or leaving a small gap open but...

Iwata

But you kept hitting dead ends.

Wakitani

Yes we did. So we experimented with redesigning the Wii MotionPlus connector plug so it fit more loosely into the connector as a way of avoiding placing strain on the connection.

Iwata

So it was a bit like fitting the plug with suspension.

Wakitani

The technical term is a "floating structure". We used the trial equipment to carry out tests on that structure and the rate of temporary disconnection declined dramatically. So we felt we were on the way to solving the contact problem. But then, just at that point...

Iwata

What happened at that point?

Wakitani

The connection hooks used to lock Wii MotionPlus into the holes at the base of the Wii Remote snapped.

Iwata

I see... Up to that point, the accessory had been connected in three places: by the plug and the two hooks. But once you'd redesigned the plug so that it was a floating structure, too much strain ended up being placed on the two hooks.

Wakitani

That's exactly it. So we thought there was no solution except to reinforce the strength of the hooks.



Ito

That's why we used steel hooks.

Iwata

Steel hooks?

Wakitani

But we went a bit over the top in reinforcing the hooks' strength...

Takamoto

...And this time the holes in the Wii Remote broke!

All

(laughter)

Iwata

So even those steel hooks didn't end up working out for you! (laughs)

Takamoto

It was at that point that someone suggested adding a tray-shaped section on the reverse side to integrate the Wii MotionPlus accessory and the Wii Remote more fully...

Iwata

It sounds like a splint for a broken bone! (laughs) But by doing that, wouldn't you make it more difficult to hold?

Takamoto

Yes, it becomes too bulky.

Iwata

So how did you finally resolve this one?

Wakitani

We decided to use a type of plastic which was very durable and could withstand the repeated strain.

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Why We Needed A Pressure Cooker

Iwata

But I've got a feeling that there were still plenty of difficulties to come, weren't there?

Wakitani

(looking through data in front of him) Do you want me to start?

Ito

Or should I go first?

All

(laughter)

Iwata

So you're telling me that there were still plenty of trials and tribulations in store for both of you.
(laughs) Okay, let's start with Ito-san. Tell me about the problems you ran into with regards to the electrical circuitry.

Ito

Okay. Well, there were a lot of things we had to contend with. For instance, when the gyro sensor's casing absorbed moisture from the air, it would affect its sensitivity.



Iwata

Could you explain a bit more about the gyro sensor's casing?

Ito

This is the material that contains the gyro sensor. Although it was made from a plastic epoxy resin, if it absorbed so much as a tiny amount of water, it would swell up and put pressure on the sensor which would prevent it from functioning properly.

Iwata

Plastic products should be completely free from moisture, shouldn't they?

Ito

That's right. It's the same as when you deep fry food with a high water content and it bursts open. If even a little water gets into the casing, when it's soldered, the sensor can split. In order to prevent that, you have to ensure that when it's being manufactured, it is in a completely dry environment. But even if you do that, it's inevitable that when players use it, it will absorb some moisture. Even the epoxy resin will expand if it absorbs any moisture.

Takamoto

At the start we tried various ways of ensuring that moisture couldn't get in, such as using a coating.

Iwata

And even then, moisture got in.

Takamoto

Whatever we did, moisture would get in.

Iwata

How did you manage to solve this tricky issue?



Ito

We made it absorb moisture right from the start, but in a controlled and efficient manner.

Iwata

So if it's going to absorb moisture anyway, you might as well let it absorb it right from the start!
(laughs)

Ito

So we boiled the entire circuit board.

Iwata

You boiled it? You're telling me you really tried that?

All

(laughter)

Iwata

Circuit boards aren't normally something you boil, you know! (laughs)

Takamoto

There are ways to get plastic to absorb moisture so that it becomes stable. One of those ways is to boil it.

Iwata

Well I never...!

Ito

So we went and bought a pressure cooker...

Iwata

A pressure cooker?

Ito

Er... And we put it on expenses. Sorry about that!

All

(laughter)



Takamoto

It actually takes an extremely long time to get the plastic to absorb the required quantity of moisture.

Iwata

Which makes mass production impossible, right?

Takamoto

That's why we needed to make it absorb the moisture in the shortest time possible.

Iwata

Which is where the pressure cooker came in! (laughs)

Takamoto

In the end, we didn't actually use it.

Iwata

I suppose it would have been a little odd to have had a row of pressure cookers on the assembly line.

All

(laughter)

Takamoto

We also purchased things like an ultrasonic washing machine used for eyeglasses...

Ito

We also researched the steamers that are used for steaming buns...

Takamoto

We'd be looking at things and going: "We might be able to use this!"

Ito

We really did spend a lot of time searching for the right one, didn't we?

Takamoto

We certainly did!

Iwata

And? In the end what method did you use for adding moisture?

Ito

We placed a normal humidifier in a room and then used a heater to adjust the temperature.

Iwata

If that's all it took, you didn't need to go and boil anything in a pressure cooker! (laughs)

Takamoto

Well, yes. That's true... (laughs) But we were looking to get it to absorb the moisture in the shortest time possible.

Ito

Even using a humidifier, it takes over 48 hours.

Takamoto

So you leave it to sit for two days... It's just like making a curry!

All

(laughter)

Iwata

With Wii MotionPlus, people might think that we've just tacked on a gyro sensor, but in fact it was a product that necessitated a huge amount of trial and error, whether it was collecting Pokémotion shop displays, making steel hooks and breaking the Wii Remote or simmering the components in a pressure cooker. You really put a lot of effort into this one! Now, just to wrap up, could I ask each of you to give a final message?

Takamoto

Up to now, the Wii Remote could only detect movements along straight lines, which may have led game developers to feel some dissatisfaction at times. But with Wii MotionPlus, because we have made it so it can detect rotation, I would like to ask you and bring out lots of games that utilise this advantage for our users to enjoy. Oh, and there's just one more thing I want to mention: there's a certain way that you have to attach the Wii MotionPlus accessory to the Wii Remote.

**Iwata**

I was at something of a loss as to how to attach the first time I attempted it. It was a bit like struggling to figure out puzzle rings. (laughs)

All

(laughter)

Takamoto

That's why we wanted to explain it in precise detail in the instruction guide. But Iwata-san put his foot down.

Iwata

Well, unfortunately not every user is going to read the instructions. Plus it's very difficult to work it out by just looking at diagrams.

Takamoto

That's why we decided to put the instructions in video form which you can see when you start Wii Sports Resort. All you have to do is watch that and you'll soon get the hang of attaching Wii MotionPlus.

Iwata

Once you've got the hang of it, it's actually very easy to attach. Okay, over to you, Wakitani-san.

Wakitani

Just speaking personally, I'm actually a huge fan of tennis, so I'm really looking forward to games coming out that allow unparalleled realism in their racquet control. I would urge all game developers to produce great new games, the likes of which we haven't seen before.

**Ito**

I have just one thing to say to all of our customers. With Wii MotionPlus, the feeling of being at one with the game — or rather the fact that you can move in exactly the way you want to — makes the concept very simple to grasp. So I would ask all of you to understand and appreciate what we were going for with Wii MotionPlus.



Ota

I'm also going to speak about something personal. Watching my daughter playing New Super Mario Bros, when she was jumping and wanted to go a little further, she would actually stretch her body with all her might.

Iwata

I think we all do that! (laughs)

Ota

Those kinds of movements that players make completely naturally couldn't be picked up with the control systems that have existed up to now. But with Wii MotionPlus, a control system is now possible that can detect how the player is feeling and respond accordingly. That's why I'm anticipating games which take the enjoyment to a whole new level, even beyond the fact that the Wii Remote controller's capabilities have expanded. And finally, I have one more thing to say to the game developers. If you have any problems, don't hesitate to get in touch!



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